

CLAIMS

What is claimed is:

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1. An apparatus for allowing specific identification of samples with probes,  
comprising
    - 5 a flexible elongated substrate having a first substrate surface, a length, and a width;  
and  
a plurality of non-identical probes immobilized on discrete areas of a probe-  
containing portion of the substrate surface, each of said discrete areas containing  
one probe.
  - 10 2. The apparatus of claim 1 wherein each discrete area containing one probe has a  
length not exceeding 500 micrometers.
  3. The apparatus of claim 1 wherein each discrete area containing one probe has a  
length not exceeding 100 micrometers.
  4. The apparatus of claim 1 wherein each discrete area containing one probe has a  
15 length not exceeding 50 micrometers.
  5. The apparatus of claim 1 wherein each discrete area containing one probe has a  
length not exceeding 20 micrometers.
  6. The apparatus of claim 1 wherein the probes are selected from the group consisting  
of polynucleotides, polypeptides, polysaccharides, and lipids.

7. The apparatus of claim 1 wherein the substrate is made of materials selected from the group consisting of silica, glass optical fibers, metals, magnetizable materials, plastics, polymers, polyimide, and polytetrafluoroethylene.
8. The apparatus of claim 1 further comprising a first marker which conveys  
5 information about a first set of said probes and a second marker which conveys information about a second set of said probes.
- Sub 32* 9. The apparatus of claim 1 wherein the ratio of the length to the width of the substrate exceeds 5:1.
10. The apparatus of claim 1 wherein the ratio of the length to the width of the substrate  
10 exceeds 100:1.
11. The apparatus of claim 1 wherein the ratio of the length to the width of the substrate exceeds 10,000:1.
12. The apparatus of claim 1 wherein the ratio of the length to the width of the substrate exceeds 100,000:1.
- 15 13. An apparatus for allowing specific identification of samples with probes, comprising
- a flexible elongated substrate having a substrate surface, a length, and a width;
- a first layer on the surface of the substrate; and
- a plurality of non-identical probes immobilized on a probe-containing portion of the  
20 surface of said layer, said probe-containing portion having a length and a width such that the ratio of the length of the probe-containing portion to the width of the probe-containing portion exceeds 5:1.

14. The apparatus of claim 13 further comprising a second layer between said first layer and said substrate.
15. The apparatus of claim 14 wherein said first layer comprises silica and said second layer comprises a metallic material.
- 5 16. A linear one-dimensional arrangement of probes, comprising
- a flexible substrate having at least a first surface; and
- a plurality of probes immobilized on the first surface of the substrate and arranged in a single-file row at a linear density exceeding 50 probes/linear cm.
- 10 17. The arrangement of claim 16, wherein the linear density of probes arranged in a single-file row on the substrate exceeds 100 probes/linear cm.
18. The arrangement of claim 16, wherein the linear density of probes arranged in a single-file row on the substrate exceeds 200 probes/linear cm.
19. The arrangement of claim 16, wherein the linear density of probes arranged in a single-file row on the substrate exceeds 500 probes/linear cm.
- 15 20. A probe-carrying tape apparatus that is configured to bind samples to form sample-probe complexes, said tape comprising
- a flexible tape substrate having a thickness not exceeding 500 micrometers, and having a surface; and
- a plurality of non-identical probes immobilized on discrete areas of a probe-
- 20 containing portion of the substrate surface, each of said discrete areas containing one probe.

21. The apparatus of claim 20 wherein the thickness of the tape does not exceed 100 micrometers.
22. The apparatus of claim 20 wherein the thickness of the tape does not exceed 20 micrometers.
- 5 23. A probe-carrying fiber apparatus that is configured to bind samples to form sample-probe complexes, said fiber comprising
- a flexible fiber substrate having a length and a diameter, wherein the diameter does not exceed 500 micrometers, and having a surface; and
- a plurality of non-identical probes immobilized on discrete areas of a probe-  
10 containing portion of the substrate surface, each of said discrete areas containing one probe.
24. The probe-carrying fiber of claim 23 wherein the diameter of the fiber does not exceed 200 micrometers.
25. The probe-carrying fiber of claim 23 wherein the diameter of the fiber does not  
15 exceed 100 micrometers.
26. The probe-carrying fiber of claim 23 wherein the diameter of the fiber does not exceed 20 micrometers.
27. An apparatus for depositing a plurality of probes on a substrate, comprising:
- a reservoir comprising an array of liquid containing wells; and
- 20 a plurality of capillaries, wherein the capillaries each have a first end and a second end, said first end of each capillary is connected to a well of the reservoir to

allow liquid content of the well to enter the capillary, said second end of each capillary allows the liquid to exit, and said plurality of second ends are arranged in a single-file row and are capable of depositing probes in a line.

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